

In the Claims

1. (Original) A transducer, comprising:

a piezoelectric disk having a first diameter;

a diaphragm disk, fixed to the piezoelectric disk, the diaphragm disk having a second diameter greater than the first diameter; and

a cover, comprising a convex surface bounded by an annulus, which mates with the diaphragm disk to form a generally plano-convex volume between the diaphragm disk and the cover.

2. (Original) A transducer according to claim 1, wherein a cross- section of the annulus is substantially linear.

3. (Currently Amended) A transducer according to claim 1 ~~or claim 2~~, wherein a cross-section of the annulus comprises a sinusoid.

4. (Currently Amended) A transducer according to ~~any of~~ claims 1-3, wherein the convex surface comprises an internal circumference, having a diameter substantially equal to the second diameter, and a groove formed along the internal circumference, and wherein the diaphragm disk is retained in contact with the cover by the groove.

5. (Currently Amended) A transducer according to ~~any of~~ claims 1-4, wherein the transducer is operative to convert electrical signals applied to the piezoelectric disk to sound waves radiated by the cover.

6. (Currently Amended) A transducer according to ~~any of~~ claims 1-5, wherein the transducer is operative to generate electrical signals from the piezoelectric disk responsive to sound waves incident on the cover.

7. (Currently Amended) A transducer according to ~~any of~~ claims 1-6, wherein the diaphragm disk is fixed substantially in parallel with and symmetrically to the piezoelectric disk.

8. (Currently Amended) A transducer according to ~~any of~~ claims 1-7, wherein the diaphragm disk, the piezoelectric disk, and the cover comprise a common axis of symmetry.

9. (Original) A loudspeaker, comprising:

a piezoelectric disk having a first diameter;

a diaphragm disk, fixed to the piezoelectric disk, the diaphragm disk having a second diameter greater than the first diameter;

a cover, comprising a convex surface bounded by an annulus, which mates with the diaphragm disk to form a generally plano-convex volume between the diaphragm disk and the cover; and

a labyrinth, which is fixedly coupled to a circumference of the annulus, and which is operative to provide a path for sound waves.

10. (Original) A loudspeaker according to claim 9, wherein a cross- section of the annulus is substantially linear.

11. (Currently Amended) A loudspeaker according to claim 9 ~~or claim 10~~, wherein a cross- section of the annulus comprises a sinusoid.

12. (Currently Amended) A loudspeaker according to ~~any of~~ claims 9-11, wherein the convex surface comprises an internal circumference, having a diameter substantially equal to the second diameter, and a groove formed along the internal circumference, and wherein the diaphragm disk is retained in contact with the cover by the groove.

13. (Currently Amended) A loudspeaker according to ~~any of~~ claims 9-12, wherein the piezoelectric disk is operative to convert electrical signals applied thereto to sound waves, and wherein the sound waves are radiated by the cover.

14. (Currently Amended) A loudspeaker according to ~~any of~~ claims 9-13, wherein the piezoelectric disk is operative to generate electrical signals responsive to sound waves incident on the cover, so that the loudspeaker acts as a microphone.

15. (Currently Amended) A loudspeaker according to ~~any of~~ claims 9-14, wherein the diaphragm disk is fixed substantially in parallel with and symmetrically to the piezoelectric disk.

16. (Currently Amended) A loudspeaker according to ~~any of~~ claims 9-15, wherein the diaphragm disk, the piezoelectric disk, the cover, and the labyrinth comprise a common axis of symmetry.

17. (Original) A method for converting between sound and electrical energy, comprising:

providing a piezoelectric disk having a first diameter;

fixing a diaphragm disk to the piezoelectric disk, the diaphragm disk having a second diameter greater than the first diameter; and

mating a cover, comprising a convex surface bounded by an annulus, with the diaphragm disk to form a generally plano-convex volume between the diaphragm disk and the cover.

18. (Original) A method according to claim 17, wherein the convex surface comprises an internal circumference, having a diameter substantially equal to the second diameter, and a groove formed along the internal circumference, the method further comprising retaining the diaphragm disk in contact with the cover by the groove.

19. (Original) A method for forming a loudspeaker, comprising:

providing a piezoelectric disk having a first diameter;

fixing a diaphragm disk to the piezoelectric disk, the diaphragm disk having a second diameter greater than the first diameter;

mating a cover, comprising a convex surface bounded by an annulus, with the diaphragm disk to form a generally plano-convex volume between the diaphragm disk and the cover; and

fixedly coupling a labyrinth to a circumference of the annulus, the labyrinth being operative to provide a path for sound waves.

20. (Original) A method according to claim 19, wherein the convex surface comprises an internal circumference, having a diameter substantially equal to the second diameter, and a groove formed along the internal circumference, the method further comprising retaining the diaphragm disk in contact with the cover by the groove.

21. (Currently Amended) A method according to claim 19 or claim 20, wherein fixedly coupling the labyrinth comprises forming a labyrinth groove in the labyrinth, and retaining the annulus in the labyrinth groove.